U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

03-AMWTP-034

MAY 16 2003

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W., Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

WASTE TREATMENT AND IMMOBILIZATION PLANT (WTP) CONCRETE SUBSIDENCE ISSUE WTP-03-054

I am attaching a copy of Bechtel National, Inc. (BNI) High Level Waste Concrete Subsidence Study Phase B (Final Report), Revision 1, concerning concrete subsidence encountered on some WTP placements. My staff, including several of the U.S. Department of Energy, Office of River Protection (ORP) consultants, have reviewed this report and consider this issue to have been thoroughly evaluated, the basis of BNI's conclusions were well founded, and we concur with the report's recommendation to accept as-is all previous basemat and wall placements. Furthermore, we have concluded that no reductions in design margin need to be made due to concrete subsidence.

The bases for these conclusions are as follows:

- All applicable codes and standards were followed in the design and placement of WTP basemats and walls.

- The methodology for identifying placements that might have significant and detrimental subsidence was reviewed and verbally approved by the Chairman of the American Concrete Institute (ACI) Committee 408 on Bond and Development of Reinforcement during joint discussions.

- Comparing as-built lap lengths for all placements having the potential for significant subsidence shows top bar factors meeting or exceeding the applicable code (ACI 318-99 or ACI 349-01).

- Additional calculations were performed assuming a 50% reduction in bond strength from subsidence, the equivalent of a top bar factor of 2.0. Using the state-of-the-art design provisions for development length recommended by ACI Committee 408 and approved by the ACI Technical Activities Committee in the fall of 2002, top bar factors for basemat placements made to date range from 2.8 to 3.2. Top bar factors for walls ranged from 2.2 to 2.3. This level of conservatism provides confidence that existing basemats and walls could handle even extreme and unrealistic levels of subsidence safely.

Provisions for future placements include:

- Continuing to design reinforcement meeting applicable codes (ACI 318-99 or ACI 349-01). These codes are very conservative for #11 bars if recommended design provisions of Committee 408 are followed.

- All cold weather placements over 24" in depth will receive revibration per Section 7.4 of ACI 309R. All parties have agreed that this eliminates subsidence as a concern in cold weather placements.

In summary, I propose closure of this issue. A video teleconference to further discuss this issue can be arranged if needed. If you have any questions, please contact me, or your staff may contact John R. Eschenberg, Manager of the Waste Treatment Plant Project, (509) 376-3681.

Sincerely,

Roy J. Schepens
Manager

AMWTP:JT

Attachment

cc w/attach:
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